1-1-2016

Evolution of an Interprofessional Patient Skills Course with the Incorporation of Simulation Scenarios

Lutana Haan
Boise State University

Rosemary Macy
Boise State University

Leslie E. Kendrick
Boise State University

Evolution of an Interprofessional Patient Skills Course with the Incorporation of Simulation Scenarios

Lutana Haan **MHS, RRT, RPSGT** *Department of Respiratory Care, Boise State University*
Rosemary Macy **PhD, RN, CNE, CHSE** *School of Nursing, Boise State University*
Leslie E. Kendrick **MS, RT(R)(CT)(MR)** *Department of Radiologic Sciences, Boise State University*

Abstract

A university level interprofessional patient care skills course including Nursing, Radiologic Sciences, and Respiratory Care students has evolved over 20 years. The course includes a lecture and laboratory portion with specific content and skills focused on principles common to the three disciplines. Students are placed in interprofessional groups during lab to practice and learn together including a simulation scenario on each week's content. This educational strategy has enhanced the students' teamwork and communication skills and prepared them to apply these skills to clinical practice. Further research is needed to look at IPE undergraduate healthcare course outcomes related to teamwork.

Received: 01/27/2015 *Accepted*: 05/19/2016

Background

Traditionally, students in the health professions are trained in their specific disciplines. However, these students need to learn how to function in a healthcare team early on in their student careers. The World Health Organization (2010): Framework for Action on Interprofessional Education & Collaborative Practice, states "Interprofessional education occurs when students from two or more professions learn about, from, and with each other to enable effective collaboration and improve health outcomes. Upon graduation, the students will be working closely with other disciplines and are expected to function as a healthcare team (Masters, O'Toole Baker & Jordon, 2012).

Three university programs located at a single Pacific Northwest institution, (Nursing, Radiologic Sciences, and Respiratory Care) had been independently teaching an entry-level patient care skills course until 1994. In the fall of 1994, the department chairs recognized a duplication of patient care skills courses being taught in each discipline. The decision was made to collaborate on a common goal and create an interprofessional course for entry-level patient care skills. Faculty from the three programs collaborated to design a course to promote increased awareness of interprofessional teamwork that occurs in the clinical settings. The new course eliminated a duplication of effort in each department and exposed students to other disciplines before they entered a healthcare setting. Interprofessional education (IPE) is a necessary step in preparing a collaborative practice-ready health workforce that is better prepared to respond to local health needs. Barr, Freeth, Hammick, Koppel, Reeves (1999), noted that one of the benefits of IPE is "Establishing common values and knowledge bases by providing information that is relevant to all of the professions involved and introducing common concepts, values, knowledge, perspectives and language" (p.568).

The purpose of this article is to describe how three health science programs have collaborated successfully since 1994 to cultivate an interprofessional patient care skills lab for entry-level healthcare students. This interprofessional course was the initial introduction of IPE for the College of Health Science (COHS).

Methods

Evolution of Interprofessional Skills Lecture Component

From 1994 to 2006 many changes occurred in the course design. The course content was split between a campus lecture and a separate skills lab. The four-hour class consisted of a one-hour lecture with a three-hour lab each week. The first year of the class the lecture was delivered by 25 interprofessional faculty all together in one lecture hall. The class presentation consisted of each topic being presented by individual faculty from each discipline conveying the importance for that field. This lecture method proved to be unsuccessful due to difficulty of managing key content objectives. Additionally, faculty often dug into details with each topic that overwhelmed the students. This model also produced difficulty with the exams, as each of the 25 faculty wrote several questions for each exam. In order to maintain consistency of delivery, the following year the number of faculty teaching the course lectures was reduced to one faculty per discipline. In 2002, eight years into this IPE course, a curricular change in the nursing program led to a division of the lecture class content into two groups. Nursing offered the theory lecture to the nursing students, and Radiologic Sciences combined with Respiratory Care conducted their own lecture; however, the lab experience remained the same. As a result of a technology grant in fall 2006, a curricular realignment was implemented in spring of 2007, bringing all the students back together for the lecture portion of the class. This was advantageous because it brought back together the interprofessional nature of the course. All students were recombined into one course, which included a weekly online lecture and a four-hour interprofessional lab. By having interprofessional faculty present topics, key skills were demonstrated and applied to a range of healthcare disciplines.

The traditional skills lectures were converted to a web-based delivery via the university's electronic course management system, thus converting this into a hybrid course. By moving the course lecture to an online format, the issue of scheduling was also removed. For the 10-week course, the lectures were divided among three faculty, one from Nursing, one from Radiologic Science, and one from Respiratory Care. The lecture content was agreed upon by all disciplines to ensure meeting the content requirements for all three curricula. The weekly lectures, along with required reading assignments, were posted one week before the upcoming labs.

Table 1. *1995 Skills Validation Requirements*

- Hand washing
- Gowning and gloving
- Apply cap and mask
- Proper body mechanics
- Use of goggles or face shield
- Make an unoccupied bed
- Moving patients:
- Position patient in bed
- Controlling the fall of a patient
- Vital Signs
- Measure blood glucose
- Ambulation with sided or generalized weakness
- Transferring patients
- Ambulation with walker
- Using a gait belt
- Bed bath
- Make an occupied bed
- Pericare with catheter
- Record oral intake
- Record urinary output
- Apply restraints
- Apply compression stockings
- Apply ace wrap to lower extremity
- Application of heat and cold therapy
- Apply sterile gloves
- Reconstitution of powder
- Correctly locate injection sites
- Administer Intradermal, intramuscular, subcutaneous injections to manikin
- Set prescribed oxygen flow rate
- Apply a nasal cannula
- Deep breathing, controlled coughing, incentive spirometry
- Oropharyngeal/nasopharyngeal suction
- Open suction to artificial airway
- Tracheostomy care
- Maintenance of chest tubes-assess tube and drainage system
- Insert an NG tube and check placement
- Gravity feeding via NG tube
- Operation of feeding pump
- Connect and regulate NG suction
- Remove an NG tube
- Administer a tap water enema
- Insert a urinary catheter (male/female)
- Venipuncture for IV infusion
- Convert IV to saline lock
- Administer medication to a saline lock
- Prime IV tubing and set drip rate
- Calculate IV drip rates
- Change IV tubing

Table 1. *2014 Skills Validation Requirements*

- Removing gown, gloves and mask
- Select correct size of blood pressure cuff; Correctly measure blood pressure, pulse and respirations
- Transfers: Patient to gurney self assist, with a slider board, wheelchair to bed, bed to wheelchair
- Pericare on a patient without catheter
- Sterile technique: Set up a sterile field with sterile objects including sterile gloves
- Draw up medication from vial, correctly Identify injection site and administer IM injection to manikin
- Use open system to suction artificial airway
- Insert NG tube, confirm placement, and remove NG tube
- Insert urinary catheter
- Prime tubing, attach to IV lock and correctly set drip rate

Evolution of Interprofessional Skills Lab Component

The evolution of the skills lab has been ongoing. Faculty within each discipline recognized there are similar skills required for student proficiency, as general healthcare providers. The three disciplines combined their proficiency lists to identify which skills would be incorporated into the laboratory experiences.

When the class began in 1994, the lab format consisted of students from all three disciplines practicing and perfecting fifty to sixty general healthcare provider skills throughout the semester (Table 1). The students in the lab would gather together but were not assigned to specific groups. Interprofessional faculty demonstrated skills in the lab, and the students practiced between 6-8 skills per week; however, they received very little feedback on their individual performance until testing came. Students were tested at midterm and finals week to validate their performance of three required skills that were randomly selected by each student. The instructors used rigorous checklists with point values

Table 1. *2014 Simulation Scenario Topics*

- Orientation
- Standard Precautions Isolation Simulation
- Vital signs
- Transfer Simulation
- I&O
- Wound Culture with Sterile Technique
- Medication Scenario
- Respiratory Simulation
- NG Simulation
- Elimination-Enema

for skills testing. The majority of the students had difficulty passing the skill validation testing due to the large number of required skills. These factors resulted in the re-evaluation of the IPE skills lab organization.

In 2003, each lab still consisted of about 30 students with three interprofessional faculty; however the students were split into interprofessional teams of 5-6 students, who remained together throughout the entire semester. This change was made to promote teamwork, recognition, and appreciation of the individuals studying in the three healthcare fields.

The course continued to provide an opportunity for hands-on practice for each week's skills content. Students practiced with midlevel fidelity manikins, which have breath sounds, heart sounds, and/or pulses (NLN-SIRC, 2013), and medical supplies needed to perform the skills. However, the lab testing was adjusted to require weekly skills validation on one specific procedure that incorporated multiple skills from that week's content. For example, urinary catheterization includes peri-care, patient education, sterile technique, and catheterization. The skills checklists were adjusted to no longer include point values, but to list key objectives as being met or not met.

Simulation Integration

In 2006, simulation was incorporated into the IPE skills lab. It has been used in interprofessional simulation-based education (IPSE) in the undergraduate healthcare

curricula and has grown over the last several years. This is a combination of interprofessional education and simulation-based education (SBE) (Gough, Hellaby, Jones, MacKinnon, 2012). The interprofessional skills course incorporates the use of simulation as a joint learning activity and the concepts with the International Nursing Association for Clinical Simulation and Learning (INASCL) standards (Standards of Best Practice: Simulation, 2013). These standards are evidence that using simulation as a method to improve interprofessional communication and collaboration with nursing and allied healthcare professionals is emerging in the literature but best practices are not yet known (Titzer, Swenty, Hoehn, 2011). Zhang, Thompson, and Miller (2011) conclude that, "Simulation can create a risk-free and error-tolerant environment that is similar to clinical settings where students from different professions can learn from and about each other to improve teamwork and quality of care"(p.118). The addition of high-fidelity simulations in the interprofessional skills course provided real life scenarios where students could apply their newly-learned skills.

In 2006 the nursing program purchased two midlevel fidelity manikins with heart sounds, lung sounds, and pulse, which previously only consisted of students working on low-fidelity manikins to insert NG tubes, Foley catheters, etc. These new manikins expanded the utilization of simulation in the skills course.

The first simulation scenarios were created for the skills course after receiving a technology grant that same year. The grant award was for $170,000 and primarily funded equipment, consulting services, and faculty support. This grant permitted the Nursing, Respiratory Care, and Radiologic Sciences faculty to integrate immersive simulations into the skills course with the goal of enhancing the ways students learn, adapt, and apply psychomotor skills as a part of the course. With the intent of further developing teamwork, the faculty from the three departments collaboratively created 10 simulated skills scenarios. The faculty had several in person meetings to find common threads such as safety, teamwork, communication, and newly learned skills that could be written into each of the simulation experiences. The 10 scenarios were incorporated into the course allowing the students to perform a skill, but also allowed the students to learn to work together as a team and communicate with the client's family members (Table 2). The simulations provided common concepts and experiences that all healthcare workers encounter in their professions.

Table 2. *2014 Simulation Scenario Topics*

- Orientation to Simulation Center
- Standard Precautions Isolation Simulation
- Vital signs
- Transfer Simulation
- I&O
- Wound Culture with Sterile Technique
- Medication Scenario
- Respiratory Simulation
- NG Simulation
- Elimination-Enema

The skills laboratory did not have any allocated space for the new simulations, so an area in the existing lab room was converted into small, simulated patient hospital room. The only enclosure for the simulation area was a hospital curtain that could be pulled closed to provide patient privacy. Other than the manikin, the first simulations did not utilize any other equipment for recording, audio, etc. A faculty member would literally stand behind the curtain and be the voice of the patient. In each student group, two individuals participated as healthcare workers, one played a family member; and two to three students would observe the interaction of the students working with a patient. The observers were off to the side of the bed watching the scenario. This set-up was rather awkward, and after several weeks it was decided to make a trip to the local electronics store for an early model video monitoring system with a small portable camera that connected to a four inch black and white television, along with a set of two-way radios. This allowed the faculty members to be in an adjacent room to be the manikin voice and watch the scenario on the small TV. The small standard video camera stood at the foot of the bed for the observing students to watch the simulation on a monitor across the room. Following each scenario, the faculty and students met around the patient bed for a debriefing session. Despite the poor quality setting, the faculty perceived the simulations as a valuable experience for the students learning.

Photograph 1. *2007 Simulation*

Results

Evolution of Interprofessional Skills Simulation Integration

From 2007 through 2010, work continued on the simulations developed for the patient care skills class. There were no real technological changes; however, progress was made toward improving debriefing skills of the faculty. After reviewing the current literature, at that time, our faculty realized the importance of debriefing and need to shift in from teacher/lecturer to facilitator. "Unlike many traditional classrooms that are teacher centered, simulations are student-centered, with the teacher playing the rolls of facilitator and evaluator." (Jeffries, 2007, p.24)

The technology grant provided funding for faculty simulation development training by several national experts. On-site training, which included debriefing techniques, scenario development, and facilitation of simulations, was provided for six faculty. These faculty met over two semesters, 1-2 times per month, to enhance their skills. Additionally, the grant provided monies for faculty workload buy-out. The core interprofessional faculty attended simulation conferences and visited a well-known simulation center. Once trained, these faculty used the train-the-trainer format to facilitate cost-efficient sustainability of simulation development of additional faculty.

The COHS administration secured funding for a simulation suite within the plans of a new health science building. In the spring of 2010, the new simulation center opened its doors. This simulation center housed a state-of-the-art six-bed facility, three debriefing rooms, control room, storage, and five high-fidelity manikins. Each room was equipped similarly to what the students would see in the clinical setting and thereby increased realism of the experience. In addition, large monitors were installed in each debriefing room with audio and video feeds from high quality cameras and microphones for student observers, thus enriching the overall experiences. The new environment created a more realistic experience for both faculty and students. The university's investment in this facility showed a true recognition of the value of simulation in healthcare education.

Student Feedback

Approval from the Institutional Review Board at the university was obtained to utilize results of the end of course evaluations. Overall, the course evaluations since the inclusion of simulation in 2006 have revealed an increase in learner satisfaction and confidence with skill performance, teamwork and communication with the client and family members. The student comments and feedback have consistently influenced the changes made to strengthen the course simulations. Some of the comments included the following:

Photograph 2. *2015 Simulation*

Photograph 3. *2015 Control Room*

Photograph 4. *2015 Debriefing*

"It [simulation] helped open my eyes a little more to know what to expect in the clinical sites." One of the goals with simulation is to allow students to work through problems on their own, and the following comment speaks to that aspect: "I liked having the ability to make mistakes without an actual patient being there. The situations were excellent learning tools, especially the debriefings." Another student stated, "My favorite aspect was the ability to be able to interact with the patient and work as a team with people in my group." Many of our scenarios had family members as part of the simulation. One of the common comments from the students was:

I liked the interaction between the client and the family because it helped me prepare for different questions or obstacles that may come my way and how to be prepared for them. I also really enjoyed discussing it at the end because it helped me learn from my mistakes and my group mistakes so that I won't repeat them at a later time. (Failla & Macauley, 2014)

A comment that speaks to the role of the observer and the importance of debriefing was: "I liked watching my fellow classmates during their simulation, because I was able to learn more by seeing and listening to them and then discussing it afterwards." The use of interprofessional simulation better prepares student of all disciplines to effectively work as a team in the healthcare setting (Failla & Macauley, 2014).

Discussion

Challenges

The concepts of IPE within our college began over 20 years ago, the progress in IPE has been a challenge due to scheduling and incorporating into the core curriculums. COHS faculty buy-in to IPE has been difficult, but with the magnitude of healthcare changes being published, the significance of this learning pedagogy is becoming more of a priority in COHS. Faculty recognition that IPE activities can be integrated into current class structures has eased the resistance to the integration of IPE into the curricula. The COHS has made IPE an initiative, not only in simulation, but in the classroom as well. The transition has developed from IPE experiences in an entry-level patient care skills course to now tasking faculty to identify courses, class activities, or college activities that will facilitate an IPE experience for students in additional courses. A key performance indicator for the college is to develop IPE opportunities for each student within the college during all four years of education (Boise State, 2014). To date, only one upper-division course has been developed for all COHS college students to apply IPE concepts.

Programmatic course schedules versus clinical experience schedules have created the most difficulty in coordinating these opportunities. This is not an uncommon barrier to successfully coordinating IPE simulations in healthcare courses. Similar scheduling conflicts were also experienced by Barnett, Hollister, and Hall, (2011). The development of these opportunities and integration into the classrooms continues to be a slow process. Time considerations and course content manipulation requires faculty motivation and coordination. The reality can be time consuming and the value difficult to envision. It is a journey that requires commitment to the success of IPE in the health care professions. The three interprofessional faculty members did develop and pilot several advanced care interprofessional simulations through a second state-supported technology grant. A portion of this grant, $16,200, was allocated for summer stipends in order to allow 1.5 weeks of seminar for 8 faculty to develop additional simulations. Topics included the rescue of a choking child and emergency response to an intravenous contrast media reaction. IPE Faculty members have discussed facilitating these and other interprofessional upper division simulations; however, this has not yet been accomplished.

Currently, numerous nursing programs and other health science programs including radiologic sciences and respiratory care are all competing for the same clinical sites in a small geographically isolated region, limiting clinical experiences with specialty patients. High-fidelity interprofessional scenarios can be used to educate IPE students and help relieve overcrowding in clinical sites. Simulations can lessen the pressure on scarce clinical sites. We have begun replacing some of the clinical time with time spent in simulation, as well as providing additional time beyond scheduled clinical time in simulation, thus reducing over-crowding in local clinical sites.

Future Directions

In the future, the faculty intend to focus on increasing the complexity of scenarios for upper division students within the three disciplines. Beyond this entry-level course described, our curriculum does not have other combined courses for the professions. With all of the specific content required for each individual specialty, it has been difficult to continue integrating interprofessional simulation opportunities beyond the sophomore years of all health professional curricula. However, we are currently working to incorporate advanced medical-surgical IPE simulations throughout the students' junior and senior years.

The focus for the interprofessional skills course has been to teach entry-level healthcare students to collaboratively work together in accomplishing common patient care interventions. It is important that students recognize that all healthcare providers possess similar basic patient care skills. Further research is needed in IPE to look at undergraduate healthcare courses and outcomes related to teamwork as more faculty recognize the value of integrating IPE into their coursework.

References

Barnett, G.V., Hollister, L.,& Hall, S.(2011). Use of the standardized patient to clarify interdisciplinary team roles. *Clinical Simulation in Nursing*, 7(5), e-169-e173. http://dx.doi.org/10.1016/j.ecns.2010.01.004

Barr, H., Freeth, D., Hammock, M., Koppel, I. & Reeves, S. (1999) Evaluating Interprofessional Education: A United Kingdom Review for Health and Social Care (London, BERA/CAIPE).

Boise State University, (2014). KPI#7: College of Health Science Interprofessional Curriculum. Retrieved from https://hs.boisestate.edu/strategicplan/undergraduate/kpi7/

Failla K. & Macauley, K., (2014, November). Interprofessional Simulation: A content analysis. *Clinical Simulation in Nursing*, 10(11), 574-580. http://dx.doi.org/10.1016/j.ecns.2014.07.006

Gough, S., Hellaby, M., Jones, N., MacKinnon, R. (2012). A review of undergraduate interprofessional simulation-based education (IPSE). *Collegian*, 19(3):153-70. http://dx.doi.org/10.1016/j.colegn.2012.04.004

Jeffries, P.R., (2007) Simulation in nursing education: From conceptualization to evaluation. New York: National League of Nursing. (2014, November).

Masters, C., O'Toole Baker, V., & Jodon, H. (2013, May). Multidisciplinary, team-based learning: The Simulated Interdisciplinary to Multidisciplinary Progressive-Level Education (SIMPLE) approach. *Clinical Simulation in Nursing*, 9(5), e171-e178. http://dx.doi.org/10.1016/j.ecns.2011.11.007

National League for Nursing Simulation Innovation Resource Center (NLN-SIRC). (2013). SIC. Glossary. Retrieved May 22, 2014, from http://sirc.nln.org/mod/glossary/view.php?id=183

Interprofessional simulation: An effective training experience for health care professionals working in community hospitals. *Clinical Simulation in Nursing*, 7(2), e61-e67. http://dx.doi.org/10.1016/j.ecns.2010.03.001

Standards of Best Practice: Simulation (2013, June). *Supplement Clinical Simulation in Nursing*, 9(65).

Titzer, J. L., Swenty, C. F., & Hoehn, W. G. (2012, October). An interprofessional simulation promoting collaboration and problem solving among nursing and allied health professional students. *Clinical Simulation in Nursing*, 8(8), e325-e333. http://dx.doi.org/10.1016/j.ecns.2011.01.001

World Health Organization. (2010). Framework for action on interprofessional education and collaborative practice. Report from the WHO study group on interprofessional education and collaborative practice. Geneva: WHO.

Zhang, C., Thompson, S., & Miller, C. (2011, July). A review of simulation-based interprofessional education. *Clinical Simulation in Nursing*, 7(4), e117-e126. http://dx.doi.org/10.1016/j.ecns.2010.02.008

Corresponding Author

Lutana Haan, MHS, RRT, RPSGT
Associate Professor and Chair

Department of Respiratory Care
HSRV 206B
Boise State University
1910 University Drive
Boise, ID 83725-1850

LutanaHaan@boisestate.edu